Configuring ATM DXI Services

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Bay Networks

Bay Networks

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About This Guide

If you are responsible for configuring Asynchronous Transfer Mode (ATM) Data Exchange Interface (DXI), you need to read this guide.

If you want to	Go to
Start a default ATM DXI configuration on a synchronous interface	Chapter 1
Learn about the ATM DXI technology and obtain a list of additional resources that describe this technology	Chapter 2
Learn about specific features of ATM DXI and how Bay Networks implements them	Chapter 3
Customize an ATM DXI interface	Chapter 4
Customize ATM DXI Permanent Virtual Circuits (PVCs)	Chapter 5
Obtain descriptions of ATM DXI parameters and learn how to edit the parameters	Appendix A
Obtain a list of parameter default settings for ATM DXI and ATM	Appendix B

Before You Begin

Before using this guide, you must complete the following procedures. For a new router:

- Install the router (refer to the installation manual that came with your router).
- Connect the router to the network and create a pilot configuration file (refer to *Quick-Starting Routers*, *Configuring BayStack Remote Access*, or *Connecting ASN Routers to a Network)*.

Make sure that you are running the latest version of Bay Networks Site Manager and router software. For instructions, refer to *Upgrading Routers from Version 7–11.xx to Version 12.00*.

Conventions

angle brackets (< >)	Indicate that you choose the text to enter based on the description inside the brackets. Do not type the brackets when entering the command. Example: if command syntax is **ping** *<ip_address>*, you enter **ping 192.32.10.12**
bold text	Indicates text that you need to enter, command names, and buttons in menu paths. Example: Enter **wfsm &**
	Example: Use the **dinfo** command.
	Example: ATM DXI > Interfaces > **PVCs** identifies the PVCs button in the window that appears when you select the Interfaces option from the ATM DXI menu.
brackets ([ ])	Indicate optional elements. You can choose none, one, or all of the options.
ellipsis points	Horizontal (. . .) and vertical (⋮) ellipsis points indicate omitted information.
italic text	Indicates variable values in command syntax descriptions, new terms, file and directory names, and book titles.
quotation marks (“ ”)	Indicate the title of a chapter or section within a book.
`screen text`	Indicates data that appears on the screen. Example: `Set Bay Networks Trap Monitor Filters`
separator (>)	Separates menu and option names in instructions and internal pin-to-pin wire connections. Example: Protocols > AppleTalk identifies the AppleTalk option in the Protocols menu.
	Example: Pin 7 > 19 > 20
vertical line (|)	Indicates that you enter only one of the parts of the command. The vertical line separates choices. Do not type the vertical line when entering the command. Example: If the command syntax is
	show at routes | **nets**, you enter either **show at routes** or **show at nets**, but not both.

Acronyms

AAL	ATM adaptation layer
ALC	Adaptation Layer Controller
ARP	Address Resolution Protocol
ATM	Asynchronous Transfer Mode
B-ISDN	Broadband Integrated Services Digital Network
CPCS	common part convergence sublayer
CS	convergence sublayer
CSU	channel service unit
DCE	data communications equipment
DSU	data service unit
DTE	data terminal equipment
DXI	Data Exchange Interface
FRE	Fast Routing Engine
ILI	Intelligent Link Interface
ILMI	Interim Local Management Interface
IP	Internet Protocol
ITU-T	International Telecommunications Union – Telecommunication Standardization Sector
LMI	Local Management Interface
MAC	media access control
OSI	Open Systems Interconnection
OSPF	Open Shortest Path First
PDU	protocol data unit
PVC	permanent virtual circuit
SAP	service access point
SAR	segmentation and reassembly
SDU	service data unit
SMDS	switched multimegabit data service
SNAP	Subnetwork Access Protocol
SNMP	Simple Network Management Protocol
VC	virtual circuit
VCC	virtual channel connection

VCI	virtual channel identifier
VPC	virtual path connection
VPI	virtual path identifier
WAN	wide area network

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Chapter 1
Starting ATM DXI

This chapter describes how to set up a synchronous interface to run the default ATM DXI configuration.

Before You Begin

Before you can start ATM DXI on your router, you must

1. Open a configuration file.
2. Specify router hardware (if using a local mode configuration file).
3. Select the link or net module interface on which you are enabling ATM DXI.

If you have questions about how to perform any of these preliminary tasks, refer to *Configuring and Managing Routers with Site Manager.*

The Technician Interface allows you to modify parameters by issuing **set** and **commit** commands with the MIB object ID. This process is equivalent to modifying parameters using Site Manager.

For more information about using the Technician Interface to access the MIB, refer to *Using Technician Interface Software*.

Caution: The Technician Interface does not validate parameter entries. Entering an invalid value can corrupt your configuration.

Adding ATM DXI to the Router

Adding ATM DXI on a router requires

1. Creating an ATM DXI Circuit
2. Enabling Protocols on an ATM DXI Circuit
3. Adding PVCs to an ATM DXI Circuit

To edit the ATM DXI Interface parameters, which define the ATM interface to the physical line, refer to Chapter 4.

Creating an ATM DXI Circuit

To create an ATM DXI circuit on an interface:

1. **Select ATM DXI from the WAN Protocols window.**

Note: The WAN Protocols window opens after you select a link or net module connector that requires a WAN protocol.

2. **Click on OK.**

   Site Manager creates the global framework for an ATM DXI circuit.

Enabling Protocols on an ATM DXI Circuit

To enable protocols on the ATM DXI circuit:

1. **Select the protocols you want to enable on this circuit from the Select Protocols window.**
2. **Click on OK.**

   For each protocol you select, the Configuration Manager displays a protocol-specific window prompting you for required information. If you need assistance in responding to any queries, consult the appropriate configuration guide.

   When you finish configuring the protocols, Site Manager displays the Configuration Manager window.

Adding PVCs to an ATM DXI Circuit

You must add at least one PVC to an ATM DXI circuit for it to function. To add a PVC:

1. **From the Configuration Manager window, select Protocols > ATM DXI > Interfaces.**

   The ATM DXI Interface List window opens. The new ATM DXI interface appears highlighted at the top of the window.

Caution: The DXI mode default setting (Mode 1A) defines specific virtual path identifier (VPI) and virtual channel identifier (VCI) ranges for this PVC. Make sure you want to use DXI Mode 1A before continuing. Refer to "Changing the DXI Mode," in Chapter 4, for more information about modifying the DXI mode setting.

2. **Click on the PVCs button.**

   The ATM DXI PVC List window opens.

3. **Click on Add.**

   The ATM DXI Virtual Circuit window opens.

4. **Supply the following information:**

   - *A VPI (virtual path identifier) number.* You must enter a valid VPI number. The range for the VPI number varies depending on the DXI Mode specified in the ATM DXI Interface List window. Since we are using the default DXI Mode in this section, enter a value between 0 and 15 for the VPI number.

Appendix , "VPI Number

   - *A VCI (virtual circuit identifier) number.* You must enter a valid VCI number. The range for the VCI number varies depending on the DXI Mode specified in the ATM DXI Interface List window. Since we are using the default DXI Mode in this section, enter a value between 32 and 63 for the VCI number.

Appendix , "VCI Number

Note: ATM DXI does not allow duplicate VPI/VCI pairs on the same physical interface. However, duplicate VPI/VCI pairs can exist as long as they reside on separate physical interfaces.

5. **Click on OK.**

   Site Manager returns you to the ATM DXI PVC List window. The default mode of the PVC you just added is GROUP ACCESS. If you want to change any of the parameters on the ATM DXI PVC List window, refer to Chapter 5, "Customizing ATM DXI PVCs," for instructions.

Note: To add another PVC with the default configuration, repeat Steps 3, 4, and 5. When you finish adding PVCs, go to Step 6.

6. **Click on Done.**

   Site Manager returns you to the ATM DXI Interface List window.

7. **Click on Done.**

   Site Manager returns you to the Configuration Manager window.

Deleting ATM DXI from the Router

To delete ATM DXI from all interfaces on the router:

1. **From the Configuration Manager window, select Protocols > ATM DXI > Delete ATM.**

   Site Manager asks

   ```
   Do you REALLY want to delete ATM?
   ```

2. **Click on OK.**

   Site Manager deletes ATM DXI from the router and returns to the Configuration Manager window.

Note: Refer to Chapter 5 for instructions on how to delete individual PVCs from an ATM DXI interface.

Where to Go Next

Use the following table to determine where you want to go next.

For information about	Go to
General ATM DXI information	Chapter 2
Specific ATM DXI features and how we implement them	Chapter 3
Customizing an ATM DXI interface	Chapter 4
Customizing ATM DXI PVCs	Chapter 5
Site Manager parameter descriptions	Appendix A
Site Manager defaults	Appendix B

Chapter 2
Understanding ATM DXI Concepts

This chapter discusses the concepts behind the ATM Data Exchange Interface (DXI) protocol and how we implement this service in Bay Networks routers.

In this chapter, you can

- Read more about ATM DXI and how it works
- Read about the kinds of support that a router running ATM DXI provides
- Review the notes describing how Bay Networks implements special ATM DXI features.

ATM DXI versus ATM

You can access an ATM network using a synchronous (that is, HSSI, V.35, or RS-449) connection or a direct ATM connection. When using a synchronous connection, you must use ATM DXI.

Unlike an ATM interface that connects directly to an ATM network, a Bay Networks synchronous link module works with a Fast Routing Engine (FRE® or FRE-2) to form an Intelligent Link Interface (ILI) pair. This ILI pair uses ATM DXI as a wide area network (WAN) protocol to connect to an ATM data service unit/channel service unit (DSU/CSU). The DSU/CSU then converts these packets into uniform 53-byte cells for transmission over the ATM network (Figure 2-1).

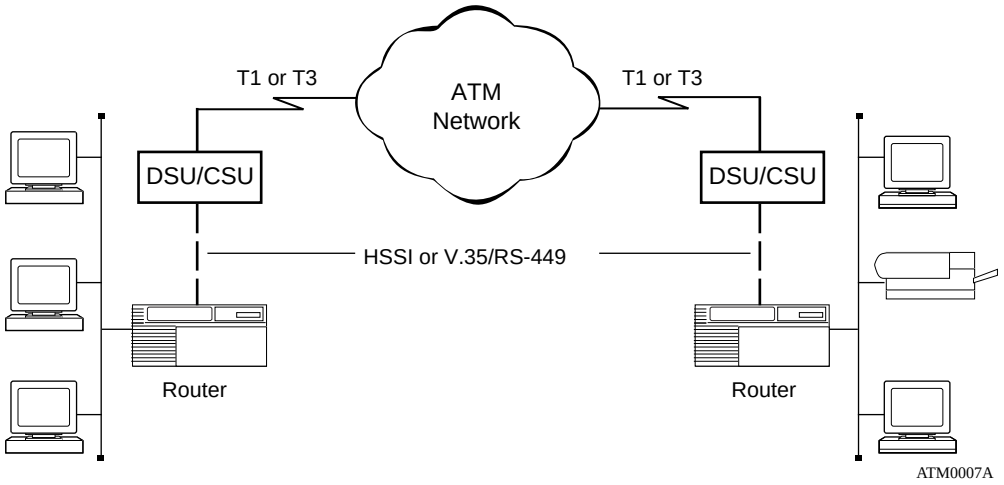

Figure 2-1. How ATM DXI Works

ATM DXI Support

A router running ATM DXI provides the following support:

- Routing IP, IPX, XNS, DECnet Phase IV, AppleTalk, and VINES traffic over the ATM network
- MAC-level transparent bridging over the ATM network
- Multiprotocol encapsulation functions defined in RFC 1294 and RFC 1483, enabling concurrent bridging and multiprotocol routing support on the same PVC
- A convergence sublayer (CS) function compatible with AAL 3/4 and AAL 5 as defined in Section 1 of the ITU-T (formerly CCITT) *B-ISDN Protocol Reference Model* (PRM)
- Error checking
- ATM DXI Link Management Interface (LMI), including Simple Network Management Protocol (SNMP) Proxy support -- a proprietary version of the LMI -- available only when using Mode 2 Proprietary DXI encapsulation with a Digital Link DSU/CSU.
- Broadcasting and multicasting support

- Address Resolution Protocol (ARP) and Inverse ARP support

The DSU/CSU supports the following layers:

- Segmentation and Reassembly (SAR) sublayer of the ATM adaptation layer (AAL)
- ATM layer defined in the B-ISDN PRM
- Physical layer interface to the ATM network through DS1 and DS3

Multiprotocol Encapsulation

Multiprotocol encapsulation enables the router to multiplex and demultiplex bridged or routed protocol data units (PDUs).

For transmission, this function adds a header from 2 through 8 octets in length to the PDU to allow decoding. The decoding process determines the proper service access point (SAP).

When receiving packets, this function evaluates the header to determine whether the PDU is a valid routed or bridged packet. If it is valid, this function then strips the header from the packet and passes it to the appropriate SAP for routing or bridging.

AAL Sublayer Support

The CS in the router logically connects to the SAR in the DSU/CSU using a common interface defined by the ATM DXI protocol. The ATM DXI protocol interface transfers PDUs between the CS and the SAR. Figure 2-2 shows the functional division of the AAL sublayers between the router and the DSU/CSU.

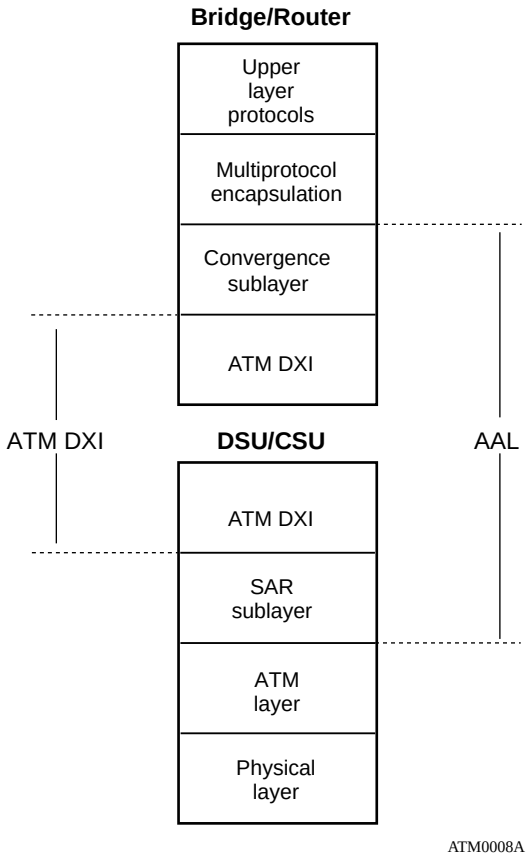

Figure 2-2. AAL Layer Division between Bridge/Router and DSU/CSU

ATM DXI Error Checking

The ATM DXI verifies

- That the VPI/VCI is valid for the PVCs configured for that ATM circuit.
- The header format that the value of the DXI Mode parameter defines.
- That the BTag field in the CS_PDU header is equal to the ETag field in the CS_PDU trailer and ensures that the frame size is valid. If the packet contains an invalid header, the router drops the packet, updates the appropriate MIB statistic, and logs the appropriate event.

Refer to "ATM DXI Modes of Operation" later in this chapter for details.

Note: The ETag and BTag fields verify that the reassembled AAL3/4 common part convergence sublayer (CPCS) frame is not just two frames concatenated together. If these two fields do not match, then the frame is most likely the concatenation of two frames.

ATM DXI LMI Support

The router supports a proprietary version of the ATM DXI Local Management Interface (LMI). This proprietary version of the LMI was a precursor to the standardized ATM Forum version.

LMI uses an SNMP-like protocol to query network management statistics maintained on the DSU/CSU MIB. The DSU/CSU may also send asynchronous events in the form of trap messages to the router.

Simulated Multicast Packet Support

ATM DXI supports multicast packets, enabling the router to take advantage of multicast functionality, if it is available from the ATM network. ATM multicasting reserves select network-assigned VPIs/VCIs as multicast addresses. The ATM network maps multiple recipients to a single VPI/VCI and delivers copies of all ATM cells to each member of the address group. As a cell passes through the ATM network, the network manipulates the cell to reveal the actual source to the cell recipient.

If no multicast address is available for the protocol (because the network interface has direct PVC access, you have not set up the service yet, or the VPI/VCI has not been entered in the Adjacent Host Table), ATM DXI simulates a broadcast packet by forwarding a copy of the message to each known PVC.

Simulated multicasting is generally used in certain address resolution techniques and for applications that require the delivery of identical information to multiple recipients.

ARP and Inverse ARP Support

ATM DXI supports the Address Resolution Protocol (ARP), enabling the router to dynamically resolve IP network layer protocol-to-VPI/VCI address mappings. ATM DXI learns the PVC address by detecting the PVC that received the ARP response.

ATM DXI also supports Inverse ARP. However, you can only use Inverse ARP if both the local and remote router support it.

Bay Networks uses proprietary methods for ARP and Inverse ARP. These methods are incompatible with third-party equipment (that is, equipment using the specifications in RFC 1577).

ATM DXI Implementation Notes

Some special features follow regarding how Bay Networks implements ATM DXI. We recommend that you read this section before attempting to customize your ATM DXI interface or PVCs.

Configuring Synchronous Lines for ATM DXI

If you enable ATM DXI on a circuit, Site Manager automatically sets synchronous line parameters as follows:

Parameter	Value
BOFL	Disable
Promiscuous	Enable
Service	Transparent
WAN Protocol	ATM DXI

For more information about these parameters, refer to *Configuring WAN Line Services*.

ATM DXI Modes of Operation

The ATM Forum's ATM DXI specification defines three modes of operation, each with a different set of operations and data transfer between the data terminal equipment (DTE; that is, the router) and the data communications equipment (DCE; that is, the DSU/CSU). The combination of the router link module and the DSU/CSU provides a User-to-Network Interface (UNI) to the ATM network.

The modes of operation are as follows:

Mode 1A

Using this mode, the DTE encapsulates the DTE service data unit (SDU) into a DXI frame and transmits it to the DCE. This mode operates with AAL 5 only. No AAL 5 functions are performed by the DTE; the DCE performs the AAL 5 and ATM layer functions.

Mode 1B

This mode serves the same purpose as Mode 1A but offers additional support for AAL 3/4 for at least one VPI/VCI.

Mode 2

This mode allows the DTE to perform the AAL 3/4 CPCS encapsulation for the DTE SDU, then puts this PDU into an ATM DXI frame. The DSU/CSU then modifies the frame to support either AAL 3/4 or AAL 5.

The DSU/CSU performs AAL functions based on whether the virtual channel connection is set for AAL 3/4 or AAL 5.

Mode 2 Proprietary

In addition to the three modes described by the ATM Forum, our implementation of the ATM DXI specification defines a fourth mode of operation: *Mode 2 Proprietary.*

This mode is a proprietary version of Mode 2 used prior to the development of ATM Forum's standard Mode 2. This version of Mode 2 has some DXI header differences from the standard Mode 2 and it handles only AAL 3/4.

Note: Use this mode if your configuration uses pre-ATM Forum DXI DSU/CSU devices (for example, a Digital Link DL3200).

Figure 2-3 illustrates how each mode handles data transfer from the router to the DSU/CSU.

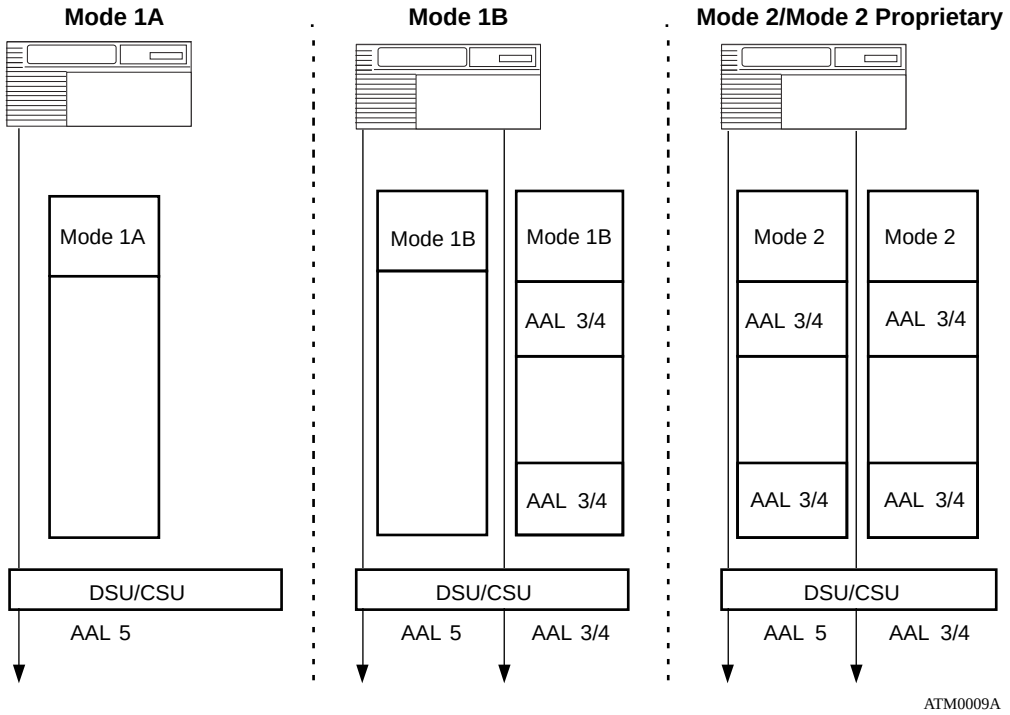

Figure 2-3. DXI Modes of Operation

To select a mode for your router, configure the DXI Mode parameter (refer to "Interface Parameters" in Appendix A for details).

Access Modes for ATM DXI Services

You can enable each ATM PVC to function in one of three access modes: *group access*, *direct access*, or *hybrid access*. Within the same ATM physical interface you can configure PVCs to use different modes. The following sections describe the access modes.

Group Access Mode

In group access mode, upper-layer protocols treat each ATM network interface as a single access point to the switched network. They use a single network address to send all traffic destined for the switched network to the ATM network interface. Figure 2-4 shows a conceptual drawing of group access mode (the default).

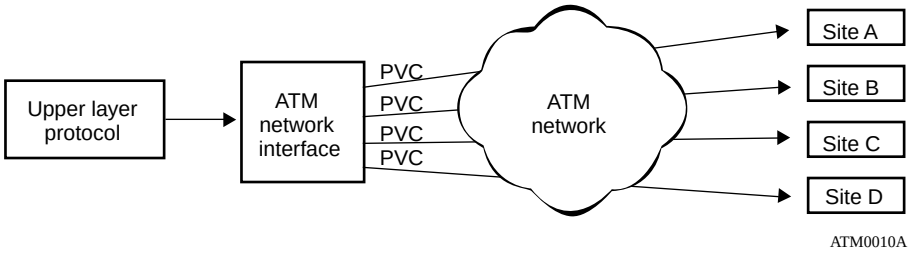

Figure 2-4. Group Access Mode

Group access supports the following protocols: IP, IPX, XNS, DECnet Phase IV, AppleTalk, VINES, and transparent bridging. Of the three modes, group access uses network addressing most efficiently and is the easiest to configure. Although you need to configure each PVC manually for group access mode, you need only define and associate protocols with the ATM network interface. All the group access mode PVCs you configure for a given ATM interface carry the protocols you select and configure to run on that interface.

Note: When you configure group access mode, the PVCs all use the AAL type that you set for the ATM DXI interface (that is, the value of the CS PDU Encapsulation parameter set in the ATM DXI Interface List window).

In a bridged environment, use group access only for fully meshed configurations, or in hub/spoke environments in which the spokes need not communicate. In a nonbridged environment, you can use group access in any configuration that does not require protocols residing on separate PVCs (that is, where all PVCs accept the same protocols).

Group access works best in either fully meshed environments or in nonmeshed environments where systems not directly connected to each other have no need to communicate. There are, however, ways to configure upper-layer protocols, like IP or IPX, to allow systems in nonmeshed networks to fully communicate. Refer to the appropriate upper-layer protocol documentation for more information.

Direct Access Mode

In direct access mode, upper-layer protocols treat the ATM network as a series of point-to-point connections (Figure 2-5). The upper-layer protocols view each PVC as an individual network interface. You can, therefore, configure each direct mode PVC individually. This is helpful if you have different network sites using different types of data encapsulation.

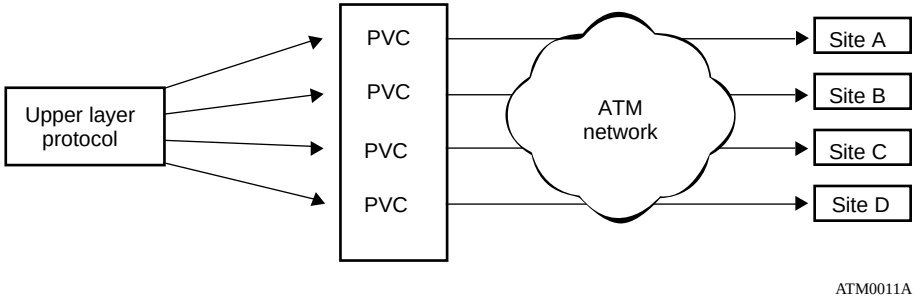

Figure 2-5. Direct Access Mode

Direct access supports the following protocols: IP, IPX, XNS, DECnet Phase IV, AppleTalk, VINES, and bridging. If you use direct access mode, you must configure each PVC manually and assign protocols to run on each PVC. This mode allows you to dedicate a PVC to a particular protocol, but at the expense of some configuration overhead, memory, and address space.

Direct access mode is best suited to small, nonmeshed configurations, or to configurations in which protocols must reside on separate PVCs.

Note: Be aware that the maximum number of PVCs you can configure in direct access mode varies, depending on the configuration of the router, the number of protocols running on the circuits, and the number of routing entries.

Hybrid Access Mode

Hybrid access mode combines characteristics of group and direct access modes. It works best for nonmeshed network configurations that use both bridging and routing over a single ATM DXI interface. This mode is also best for spanning tree bridging.

If your network combines bridging and routing over the same interface, you not only need PVCs in group access mode for routing, but you also need bridging to operate over these same PVCs. Since group access mode does not allow for bridging in nonmeshed environments, you must use hybrid access mode. In this mode, a PVC behaves like a direct access PVC for bridging while maintaining group access characteristics for routing protocols (Figure 2-6).

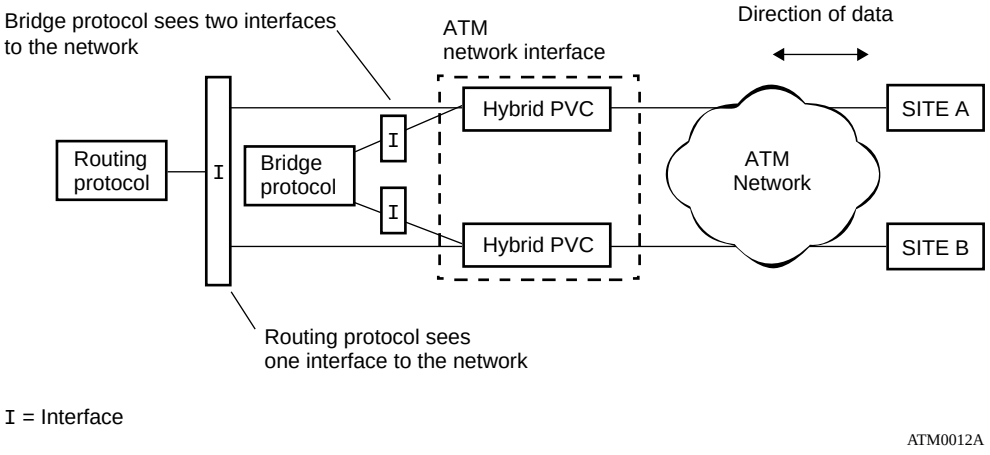

Figure 2-6. Hybrid Access Mode

For hybrid access mode, you must configure all PVCs manually and assign bridging protocols to run on each PVC. Hybrid access supports all protocols that are available for the ATM interface: IP, IPX, XNS, DECnet Phase IV, AppleTalk, VINES, and bridging.

Note: When you select hybrid access mode for a PVC, Site Manager provides only three protocol options: Bridge, Spanning Tree, and Native Mode LAN (NML). These protocols, as well as the protocols that are on the ATM interface, can run on the PVC.

Before you configure hybrid access on your router, carefully evaluate the types of routers you are connecting in your network. For example, combining Series 7 routers running in group access bridge mode with Series 7 (or later) routers running in hybrid access mode may cause broadcasting or spanning tree problems. If you plan to configure such a network, contact the Bay Networks Technical Solutions Center.

Using Hybrid Access for Transparent Bridging

In Figure 2-7, traffic bridges between Sites A and B. The bridge (Router 1) runs on an ATM DXI interface and its configuration defines the PVCs as group access mode. In the figure:

1. The bridge receives data from Site A.
2. If the bridge does not recognize the destination address, it tries to direct traffic through another bridge port.
3. With the PVCs in group access mode, the ATM bridge port views the paths to Site A and Site B as the same.
4. Because the bridge does not send out data on the same bridge port from which it just received it, the bridge does not direct the data to Site B.
5. As a result, in this example, you need to use hybrid access mode.

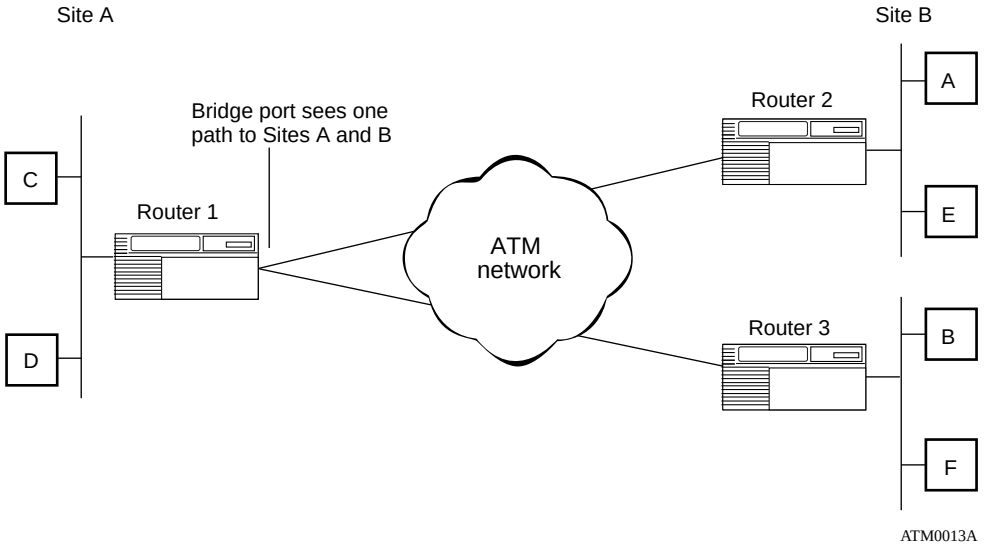

Figure 2-7. Example of a Bridged Network

If you define the PVCs to be in hybrid access mode (refer to Figure 2-6), each PVC acts as a bridge port. This enables the bridge running on the ATM interface to view the traffic from Site A as arriving on a different port than that of Site B. When the bridge sends out data, it now has access to all of its ports, including the port that accesses Site B. Therefore, data from Site A can reach Site B.

Using Hybrid Access for Routing

In hybrid access mode, routing protocols view the ATM network interface in terms of group access PVCs, as described in the "Group Access Mode" section, earlier in this chapter.

ATM DXI and Multipath Support

Our implementation of ATM DXI provides multipath redundancy. This means, for example, that if there are two physical lines and one line fails, the other takes over the task of transmission (redundancy). If both lines are working, the router uses both lines simultaneously (multipath).

The multipath feature lets you group several lines that back up one another to ensure that information makes it across the network. Figure 2-8 shows a network with two physical links across the ATM network.

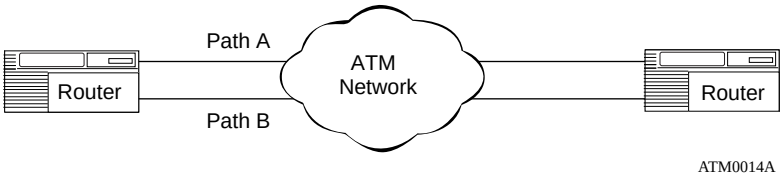

Figure 2-8. Multipath Network

In this example, when the router receives traffic destined for the network, it alternately chooses Path A or Path B, at random, to transmit the data. The router uses both lines, simultaneously, to balance the load. If one of these connections fails, the router uses the remaining path.

You can configure multipath for direct access mode PVCs only. The most significant part of configuring multipath is how you set a PVC's VPI/VCI pair. This number identifies each PVC, thereby identifying a path for the router to direct data out to the network.

See "Setting PVCs for Multipath Mode," in Chapter 3 for instructions on configuring multiple PVCs to run in multipath mode.

Note: If you use multipath mode, packets traveling on the two paths may arrive at their destination out of sequence. Some protocols do not tolerate packets arriving out of sequence. As a result, you may experience poor performance or failures.

ATM Layers

The B-ISDN protocol reference model, on which ATM is based, consists of four layers. Each layer communicates only with the layer either directly above it or directly below it. Figure 2-9 shows the B-ISDN ATM protocol reference model.

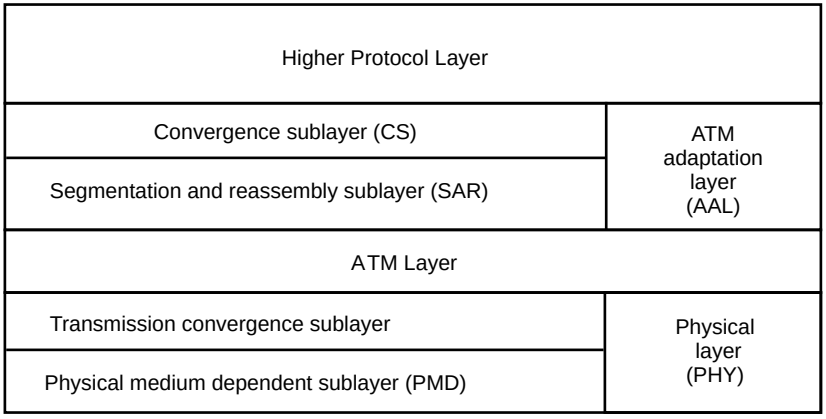

Figure 2-9. B-ISDN ATM Protocol Reference Model

The following layers relate directly to how Bay Networks routers support ATM DXI:

- ATM layer
- ATM adaptation layer (AAL)

The *ATM layer* defines how two nodes transmit information between them. It is concerned with the format and size of the cells and the contents of the headers. The addresses of the cells are meaningful only to the two adjacent local nodes (that is, usually not to the end nodes).

The *ATM adaptation layer (AAL)* converts higher-layer protocol data into formats that are compatible with the requirements of the ATM layer, enabling ATM to handle different types of information all within the same format.

The AAL is divided into two sublayers: the *convergence sublayer (CS)* and the *segmentation and reassembly (SAR) sublayer*. These two sublayers convert variable-length messages into 48-byte segments, while ensuring the integrity of the data.

The CCITT (now ITU-T) has defined different types of AALs to handle different kinds of traffic. Bay Networks routers support AAL 3/4 and AAL 5. The next two sections describe the AAL process.

AAL 3/4

In the AAL 3/4 process, a convergence sublayer (CS) header and trailer envelop the data from the higher layer protocols, creating a CS protocol data unit (PDU).

AAL 3/4 divides the PDU into 44-octet segments. Each segment is encapsulated with a segmentation and reassembly (SAR) header and trailer, creating a 48-octet SAR PDU. This 48-octet SAR PDU is the payload of the ATM cell (Figure 2-10).

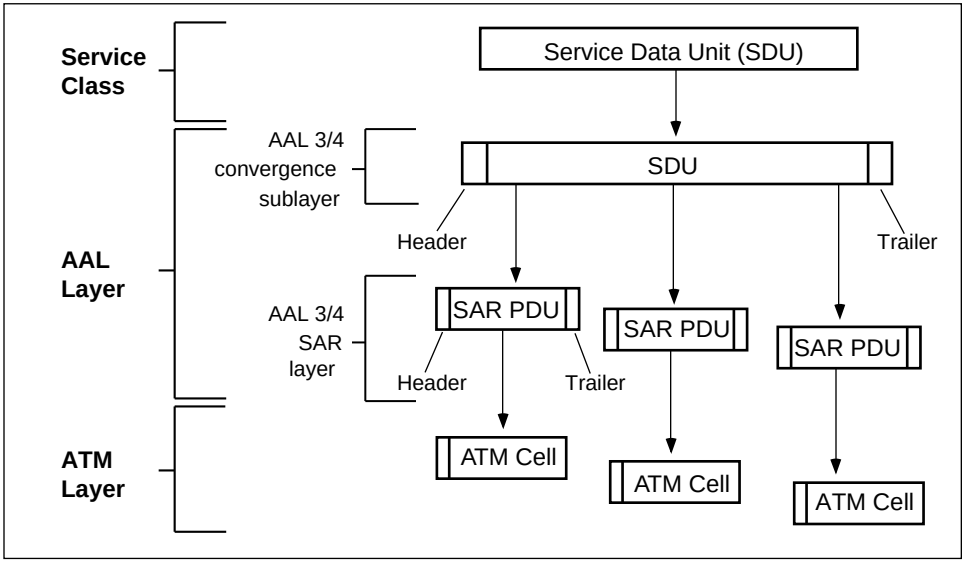

Figure 2-10. ATM Adaptation Layer 3/4

AAL 5

In AAL 5, only a trailer attaches to the data from the higher layer protocols to create a CS PDU. AAL 5 divides the PDU into a 48-octet SAR PDU; however, it does not add an SAR header and trailer. This 48-octet SAR PDU becomes the payload of the ATM cell (Figure 2-11).

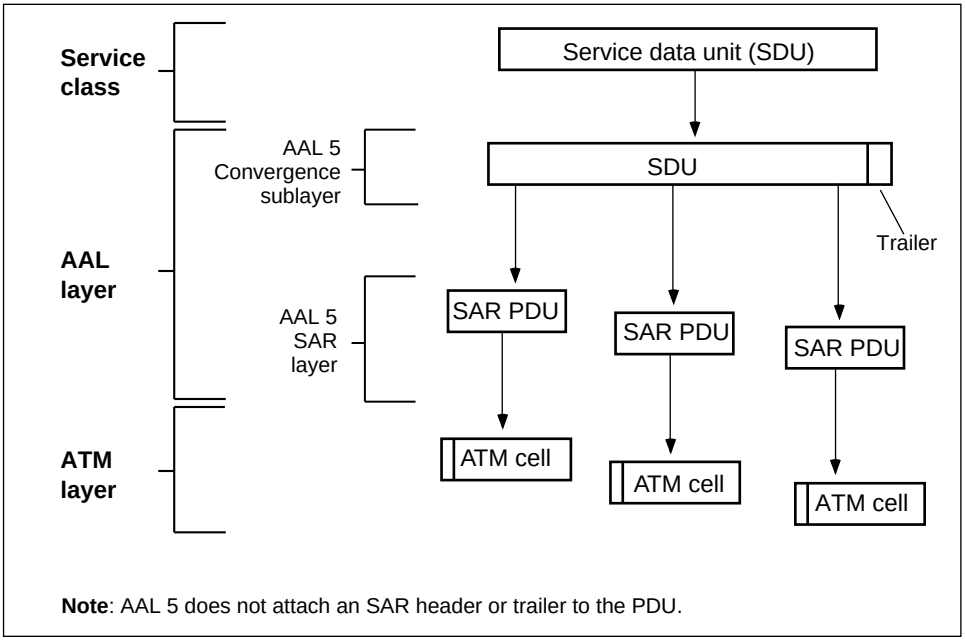

Figure 2-11. ATM Adaptation Layer 5

Data Transmission

Data transmission (also called *cell switching*) through the ATM network relies on the establishment of logical connections between ATM entities. ATM is a *connection-oriented* service. This means that an ATM entity cannot transmit information until it establishes a connection with a receiving entity. These connections consist of *virtual channels*, *virtual paths*, and *transmission paths*.

A *virtual channel* is a logical connection between two communicating ATM entities. Each virtual channel may carry a different protocol or traffic type. The virtual channel transports cells that have a common identifier. The identifier is called the virtual channel identifier (VCI) and is part of the cell header. You can establish virtual channels permanently or set them up dynamically, allowing the network to adjust itself to the traffic demand.

A *virtual path* is a set of virtual channels between a common source and destination. The virtual channels in a virtual path logically associate to a common identifier. This identifier is called the virtual path identifier (VPI) and is part of the cell header. You can base cell switching on either the VPI alone, or on a combination of the VPI and VCI.

Virtual paths enable you to separate network transport functions into those related to an individual logical connection (virtual channel) and those related to a group of logical connections (virtual path).

A *transmission path* is a physical connection that comprises several virtual paths, each virtual path containing several virtual channels. The transmission path may support multiple virtual paths across a single connection to the network.

Figure 2-12 shows the relationships between the virtual channel, the virtual path, and the transmission path.

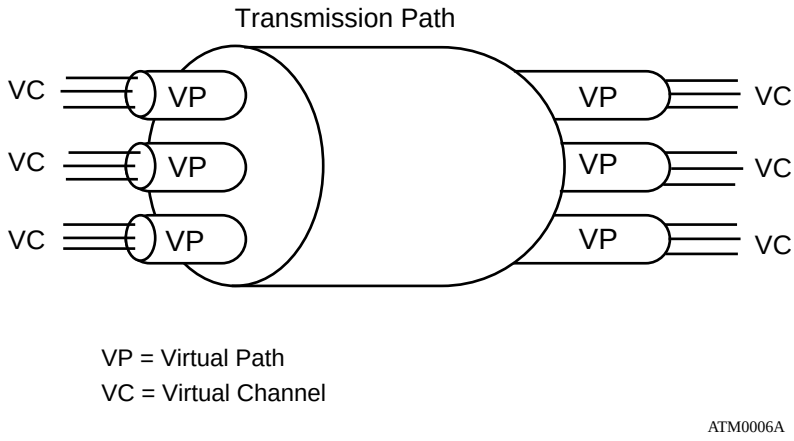

Figure 2-12. ATM Transmission Components

For More Information

For more information about ATM, refer to the following documents:

ATM Forum. *ATM Data Exchange Interface Specification*. Version 1.0. August 1993.

ATM Forum. *ATM User-Network Interface Specification*. Version 3.0. September 1993.

Bellcore Document SR-NWT-001763, Issue 1. *Preliminary Report on Broadband ISDN Transfer Protocols*. December 1990.

———, FA-NWT-001109. *Broadband ISDN Transport Network Elements Framework Generic Criteria*. December 1990.

———, FA-NWT-001110. *Broadband ISDN Switching System Framework Generic Criteria.* December 1990.

Bradley, T., Brown, C., and Malis, A. *Multiprotocol Interconnect over Frame Relay.* RFC 1294. Network Working Group. January 1992.

De Prycker, M. *Asynchronous Transfer Mode: Solution for Broadband ISDN*. Ellis Horwood Limited, 1991.

Handel, R. and Huber, M. *Integrated Broadband Networks: An Introduction to ATM-Based Networks*. Reading, Massachusetts: Addison-Wesley Publishing Company, 1991.

Heinanen, J. *Multiprotocol Encapsulation over ATM Adaptation Layer 5*. RFC 1483. Network Working Group. July 1993.

Where to Go Next

Use the following table to determine where you want to go next.

For information about	Go to
Starting ATM DXI	Chapter 1
General ATM DXI information	Chapter 2
Specific ATM DXI features and how we implement them	Chapter 3
Customizing an ATM DXI interface	Chapter 4
Customizing ATM DXI PVCs	Chapter 5
Site Manager parameter descriptions	Appendix A
Site Manager defaults	Appendix B

Chapter 3
ATM DXI Window Basics

This chapter provides some guidelines for using Site Manager ATM DXI windows. For more detailed instructions on specific Site Manager buttons or menu selections, refer to *Configuring and Managing Routers with Site Manager*.

Adding or Copying PVCs

When adding or copying a PVC, keep the following in mind:

- Whether you add or copy a PVC, you can always customize it later.
- When you run PVCs in direct or hybrid access mode, the copy function copies all of the existing PVC-specific information to the new PVC. However, this function does not copy the protocols that you have selected and configured for that PVC. You must reselect and reconfigure any desired protocols for the newly copied PVC.

Setting PVCs for Multipath Mode

Setting PVCs in Multipath Mode provides a form of redundancy. For example, if there are two physical lines and one line fails, the other takes over transmission (redundancy). If both lines are working, the router uses both lines simultaneously (multipath).

The multipath feature lets you group two or more PVCs to ensure that information makes it across the network. When setting PVCs for multipath mode, keep the following in mind:

- The PVCs must have the same VCI and VPI numbers.
- You can only set direct access PVCs to operate in multipath mode.

To set PVCs to use multipath mode:

1. **From the Configuration Manager window, select Protocols > ATM DXI > Interfaces.**

   The ATM DXI Interface List window opens.

2. **Click on PVCs.**

   The ATM DXI PVC List window opens.

3. **Select the first PVC you want to run in multipath mode.**

4. **Click on Multipath.**

   The Multipath Selection window opens. This window shows all PVCs that you can set for multipath mode, along with the PVC you selected.

5. **Select a PVC that you want to group with the first PVC.**

6. **Click on Select.**

   The ATM DXI PVC List window opens.

7. **Repeat this procedure until you select all of the PVCs that you want to run in multipath mode.**

Managing Protocols

As long as your interface contains at least one PVC, you can add, delete, or edit bridging/routing protocols. However, which protocol menu you use depends on the access mode of the PVC. Table 3-1 shows the appropriate protocol menu to use for each access mode.

Table 3-1. Locating a Protocol Menu

PVC Access Mode	Circuit Definition Window	ATM DXI PVC List Window
Group	✔	
Hybrid		✔
Direct		✔

Use the following path to access the Circuit Definition window:

Configuration Manager > **Sync** > **Edit Circuit** > Group Protocols

Use the following path to access the ATM DXI PVC List window:

Configuration Manager > Protocols > ATM DXI > Interfaces > **PVCs** > Protocols

For each protocol you add, you must enter any required protocol-specific information. If you need assistance in responding to any queries, consult the appropriate guide.

Note: Selecting the bridge protocol for a hybrid or direct mode PVC automatically sets Multiprotocol Encapsulation to Enable.

Where to Go Next

Use the following table to determine where you want to go next.

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Site Manager parameter descriptions	Appendix A
Site Manager defaults	Appendix B

Chapter 4
Customizing an ATM DXI Interface

Once you add ATM DXI to your router, you may want to customize the ATM DXI interface for your specific network configuration.

Note: You must first add ATM DXI to the router before you can customize the ATM DXI interface. For instructions on how to start ATM DXI, or how to add additional ATM DXI interfaces, refer to Chapter 1.

Enabling or Disabling the Interface

By default, you enable the synchronous interface when you start ATM DXI. However, you can enable or disable the interface at any time.

Appendix , “Enable

Entering an Interface Description

Site Manager allows you to enter an alphanumeric description of the interface; the description can contain up to 63 alphanumeric characters or spaces. Though entering a description is optional, this management feature helps you easily identify the interface.

Appendix , “Interface Description

Changing the DXI Mode

The ATM DXI mode indicates the mode of operation for this interface based on the ATM Forum *ATM Data Exchange Interface Specification*. Each mode relates to different functional settings between the router and the DSU/CSU.

Note: The DXI header size is different for Modes 1A and 1B than for Mode 2 and Mode 2 Proprietary. This difference affects the values that you can set for the VPI and VCI. Refer to "Setting a VPI Number" and "Setting a VCI Number" in Chapter 5 for the allowable VPI and VCI settings for each mode.

By default, the ATM DXI interface uses Mode 1A. This mode operates only with AAL 5 encapsulation. Refer to "ATM DXI Modes of Operation" in Chapter 2 for a detailed description of each mode.

Appendix , "DXI Mode

Caution: When assigning data encapsulation to an interface, make sure that the router encapsulation method matches that of the DSU/CSU.

Assigning a Maximum Number of Virtual Circuits

By default, ATM DXI allows for a maximum of 512 permanent virtual circuits on each interface; however, you can specify from 1 through 512 virtual circuits.

Appendix , "Max number of VCs

Assigning Data Encapsulation

The ATM DXI interface allows both multiprotocol encapsulation and CS PDU encapsulation.

Multiprotocol encapsulation determines whether the outbound packets on the interface are encapsulated with a Network Layer Protocol ID (NLPID; RFC 1294) or Logical Link Control / Subnetwork Access Protocol (LLC/SNAP; RFC 1483) multiprotocol header. All group or hybrid access mode PVCs on the interface use the value you set for this field.

CS PDU encapsulation determines whether the outbound packets on the grouped virtual channels use AAL 3/4 CS_PDU encapsulation or AAL 5 CS_PDU encapsulation. All group and hybrid access mode PVCs on the interface use the value you set for this field.

Selecting a Multiprotocol Encapsulation Method

You can use one of three multiprotocol encapsulation methods for the ATM DXI interface -- LLC/SNAP, NLPID, or NO MPE.

We recommend that you use the default setting, LLC/SNAP, when selecting a multiprotocol encapsulation method. However, keep the following exceptions in mind:

- If you are running a router software version earlier than Version 8.00, use NLPID for backward compatibility.
- If you specify NO MPE, the router interprets this as virtual channel-based multiplexing, which is not supported for bridging.

Appendix , “Multiprotocol Encapsulation

Caution: When assigning data encapsulation to an interface, make sure that the encapsulation method matches that of the DSU/CSU.

Selecting a CS PDU Encapsulation Method

You can use one of three CS PDU encapsulation methods at the ATM DXI interface level -- AAL 5 Encapsulation, AAL 3/4 Encapsulation, and No Encapsulation.

Defining the CS PDU encapsulation on the interface level sets the default value for any PVCs you may add. Normally, any new PVCs use the default AAL 5 encapsulation. By setting the CS PDU encapsulation method to AAL 3/4 at the interface level, all new PVCs that you add to the interface automatically use AAL 3/4 encapsulation.

Use No Encapsulation (a proprietary value) if you do not want the interface to use any CS PDU encapsulation.

When selecting a CS PDU encapsulation, choose the encapsulation method that you want most PVCs on the interface to use. You can always change the encapsulation method for individual PVCs after you add them.

Appendix , “CS PDU Encapsulation

Caution: When assigning data encapsulation to an interface, make sure that the encapsulation method matches that of the receiving device on the other end of the ATM network.

Enabling or Disabling the Multicast Function

By default, the ATM DXI interface does not accept multicast packets. However, you can enable the multicast function to accept multicast packets.

Appendix , “Multicast

Enabling or Disabling LMI

To assist in obtaining traps and statistical information from the ATM DSU/CSU, Bay Networks includes a proprietary version of Local Management Interface (LMI) with ATM DXI. This LMI is incompatible with the ATM Forum standard LMI, and only operates under the Mode 2 Proprietary DXI mode.

Caution: If you disable LMI, the DSU/CSU cannot report traps to the router and the router cannot retrieve statistical information from the DSU/CSU.

By default, this function is enabled. If you do not want LMI available for the interface, set the value to Disabled.

Appendix , “LMI Enable

Where to Go Next

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Chapter 5
Customizing ATM DXI PVCs

Once you add PVCs to your router, you may want to customize them for your specific network configuration.

Note: You must first add an ATM DXI interface to the router and add PVCs to that interface before you can customize any PVCs. For instructions on how to start ATM DXI, how to add ATM DXI interfaces, or how to add PVCs to an ATM DXI interface, refer to Chapter 1.

Setting a VPI/VCI Pair

A virtual path is a set of virtual channels between a common source and destination. The virtual channels within a virtual path logically associate to a common identifier. This identifier is called the virtual path identifier (VPI) and is part of the cell header.

A virtual channel is a logical connection between two communicating ATM entities. Each virtual channel may carry a different protocol or traffic type. The virtual channel transports cells that have a common identifier. The identifier is called the virtual channel identifier (VCI) and is part of the cell header.

Note: ATM DXI does not allow duplicate VPI/VCI pairs on the same ATM physical interface (that is, on the same link module). However, duplicate VPI/VCI pairs can exist on different physical interfaces (that is, on different link modules).

Setting a VPI Number

The VPI number does not have a default setting. You must enter a valid VPI number for each PVC you create. Depending on the DXI Mode you specify for the interface, the range for the VPI number varies as follows:

- Mode 1A or Mode 1B -- enter a value from 0 through 15.
- Mode 2 or Mode 2 Proprietary -- enter a value from 0 through 255.

Appendix , “VPI Number

Setting a VCI Number

The VCI number does not have a default setting. You must enter a valid VCI number for each PVC you create. Depending on the DXI Mode you specify for the interface, the range for the VCI number varies as follows:

- Mode 1A or Mode 1B -- enter a value from 32 through 63.
- Mode 2 or Mode 2 Proprietary -- enter a value from 32 through 65535.

Appendix , “VCI Number

Enabling or Disabling a PVC

By default, you enable a PVC when you create it. However, you can enable or disable a specific PVC at any time.

Appendix , “Enable

Changing the PVC Access Mode

You can enable each PVC to function in one of three access modes -- group access, direct access, or hybrid access. The PVC Access Mode indicates how the PVC behaves within the network. You can configure PVCs to use different modes within the same physical interface.

Note: Refer to "Access Modes for ATM DXI Services" in Chapter 2 for more information about these three modes.

When customizing each PVC, keep the following in mind:

- Accept the default, Group Access, if you want the PVC to act as part of a group of PVCs. All group access PVCs on an interface use the same protocols. This means that when you modify a protocol for one group PVC, you are modifying that protocol for all of the group PVCs.
- Set the mode to Hybrid Access if you want the PVC to act as part of a group of PVCs when routing and to act alone when bridging.
- Set the mode to Direct Access if you want the PVC to bridge or route to different networks than do group access or hybrid access PVCs.

Appendix , "Mode

Assigning Data Encapsulation

The ATM DXI interface allows both multiprotocol encapsulation and CS PDU encapsulation.

Multiprotocol encapsulation determines whether the outbound packets on the interface are encapsulated with a NLPID (RFC 1490) or LLC/SNAP (RFC 1483) multiprotocol header. All group or hybrid access mode PVCs on the interface use the value you set for this field.

CS PDU encapsulation determines whether the outbound packets on the grouped virtual channels use AAL 3/4 CS_PDU encapsulation or AAL 5 CS_PDU encapsulation. All group and hybrid access mode PVCs on the interface use the value you set for this field.

Selecting a Multiprotocol Encapsulation

You can use one of three multiprotocol encapsulation methods for each ATM DXI PVC -- LLC/SNAP, NLPID, and NO MPE.

We recommend that you use the default setting, LLC/SNAP, when selecting a multiprotocol encapsulation method. However, keep the following exceptions in mind:

- If you are running a router software version earlier than Version 8.00, use NLPID for backward compatibility.
- If you specify NO MPE, the router interprets this as virual channel-based multiplexing, which is not supported for bridging.

Appendix , “Multiprotocol Encapsulation

Caution: When assigning data encapsulation to an interface, make sure that the encapsulation method matches that of the DSU/CSU.

Selecting a CS PDU Encapsulation

You can use one of three CS PDU encapsulation methods at the ATM DXI PVC level -- AAL 5 Encapsulation, AAL 3/4 Encapsulation, and No Encapsulation.

Normally, any new PVCs use the default AAL 5 encapsulation. Setting the CS PDU encapsulation method to AAL 3/4 at the interface level makes all new PVCs that you add to the interface automatically use AAL 3/4 encapsulation. Defining the CS PDU encapsulation on the PVC level overrides the default value that you set on the interface level.

You can use No Encapsulation (a proprietary value) if you do not want the PVC to use any CS PDU encapsulation.

Appendix , “CS PDU Encapsulation

Caution: When assigning data encapsulation to an interface, make sure that the encapsulation method matches that of the receiving device on the other end of the ATM network.

Enabling or Disabling the Multicast Function

By default, ATM DXI PVCs do not accept multicast packets. However, you can enable the multicast function to accept multicast packets.

Appendix , “Multicast

Where to Go Next

Use the following table to determine where you want to go next.

For information about	Go to
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Appendix A
Site Manager Parameter Descriptions

Virtual Path and Virtual Circuit Parameters

Parameter:	**VPI Number**
Path:	Configuration Manager > Protocols > ATM DXI > Interfaces
Default:	None
Range:	0 through 255
Function:	Identifies the virtual path of the PVC.
Instructions:	How you set this parameter depends on how you set the DXI Mode parameter in the ATM DXI Interface List window (refer to the DXI Mode parameter later in this appendix). If you select Mode 1A (default) or 1B for the DXI Mode value, enter a value from 0 through 15. If you select Mode 2 or Mode 2 Proprietary, enter a value from 0 through 255. Refer to Chapter 5 for more information.
MIB Object ID:	1.3.6.1.4.1.18.3.5.9.5.14.1.3

Parameter: **VCI Number**

Path: Configuration Manager > Protocols > ATM DXI > Interfaces

Default: None

Range: 32 through 65535

Function: Identifies the virtual channel of the PVC.

Instructions: How you set this parameter depends on how you set the DXI Mode parameter in the ATM DXI Interface List window (refer to the DXI Mode parameter later in this appendix). If you select Mode 1A (default) or 1B for the DXI Mode value, enter a value from 32 through 63. If you select Mode 2 or Mode 2 Proprietary, enter a value from 32 through 65535. Refer to Chapter 5 for more information.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.14.1.4

Interface Parameters

Parameter: **Enable**

Path: Configuration Manager > Protocols > ATM DXI > Interfaces

Default: Enable

Options: Enable | Disable

Function: Enables or disables ATM DXI on the selected interface.

Instructions: Set to Disable if you want to disable ATM DXI for the selected interface.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.2.1.2

Parameter: **Interface Description**

Path: Configuration Manager > Protocols > ATM DXI > Interfaces

Default: None

Range: 1 through 63 alphanumeric characters

Function: Describes the selected ATM interface.

Instructions: Enter text to describe the destination or purpose of the interface.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.2.1.7

Parameter: **DXI Mode**

Path: Configuration Manager > Protocols > ATM DXI > Interfaces

Default: Mode 1A

Options: Mode 1A │ Mode 1B │ Mode 2 │ Mode 2 Proprietary

Function: Identifies the ATM DXI mode of operation for this interface, based on the ATM Forum ATM DXI specification. Each mode relates to a different set of operations and functionality between the router and DSU/CSU.

Instructions: Enter the desired mode of operation. Refer to "ATM DXI Modes of Operation" in Chapter 2 for a detailed description of each mode.

The DXI header size is different for Modes 1A and 1B than for Mode 2 and Mode 2 Proprietary. This difference affects the value that you set for the VPI and VCI parameters. For allowable VPI and VCI entries for each mode, refer to "Setting a VPI/VCI Pair" in Chapter 5.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.2.1.18

Parameter: **Max number of VCs**

Path: Configuration Manager > Protocols > ATM DXI > Interfaces

Default: 512

Range: 1 through 512

Function: Specifies the maximum number of virtual channels (VCs) allowed on the selected interface. This value is for PVCs only.

Instructions: Accept the default, 512, or enter a different value between 1 and 512, inclusive.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.2.1.5

Parameter: Multiprotocol Encapsulation

Path: Configuration Manager > Protocols > ATM DXI > Interfaces

Default: LLC/SNAP

Options: LLC/SNAP │ NLPID │ NO MPE

Function: Determines whether the outbound packets on the selected interface are encapsulated with a multiprotocol header per RFC 1490 (NLPID) or RFC 1483 (LLC/SNAP). All group or hybrid access mode PVCs configured for the selected interface use the value you set for this field.

Instructions: We recommend selecting LLC/SNAP.

If you are running an ATM DXI version earlier than Version 8.00, select NLPID for backward compatibility.

If you select NO MPE, the router interprets this as virtual channel-based multiplexing, which is not supported for bridging.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.2.1.11

Parameter: CS PDU Encapsulation

Path: Configuration Manager > Protocols > ATM DXI > Interfaces

Default: AAL5 Encapsulation

Options: AAL5 Encapsulation │ AAL3/4 Encapsulation │ No Encapsulation

Function: Determines whether the outbound packets on the grouped virtual channels use the AAL 3/4 CS_PDU encapsulation or the AAL 5 CS_PDU encapsulation. The encapsulating method is based on the ATM Forum's ATM DXI specification. All group and hybrid access mode PVCs configured for the selected interface use the value you set for this field.

Instructions: Choose either AAL 3/4 or AAL 5 according to the desired encapsulation method. No Encapsulation is a proprietary value. Select this value when you do not want CS_PDU encapsulation.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.2.1.12

Parameter: **Multicast**

Path: Configuration Manager > Protocols > ATM DXI > Interfaces

Default: Disable

Options: Enable │ Disable

Function: Indicates whether the selected ATM DXI interface supports multicast packets.

Instructions: Accept the default, Disable, if you do not want the interface to accept multicast packets. Set to Enable if you want the selected interface to accept multicast packets.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.2.1.13

Parameter: **LMI Enable**

Path: Configuration Manager > Protocols > ATM DXI > Interfaces

Default: Enable

Options: Enable │ Disable

Function: Specifies whether our proprietary version of the Local Management Interface (LMI) is enabled for the selected interface. This LMI is not compatible with the ATM Forum standard LMI, and is only for use with DXI Mode 2 Proprietary.

Instructions: Accept the default, Enable, if you want LMI enabled for the interface. Set to Disable if you do not want LMI available for the interface.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.2.1.15

PVC Parameters

Parameter: **Enable**

Path: Configuration Manager > Protocols > ATM DXI > Interfaces > **PVCs**

Default: Enable

Options: Enable │ Disable

Function: Specifies whether this PVC is enabled for the selected interface.

Instructions: Set to Disable if you do not want this PVC enabled.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.14.1.14

Parameter: Mode

Path: Configuration Manager > Protocols > ATM DXI > Interfaces > **PVCs**

Default: Group Access

Options: Group Access │ Hybrid Access │ Direct Access

Function: Specifies the role of the PVC.

Instructions: Accept the default, group access, if you want the PVC to be part of a group of PVCs. Set to hybrid access if you want the PVC to be part of a group of PVCs for routing, and to direct access for bridging. Set to direct access if you want the PVC to be used for bridging or routing to different networks.

For more information about the three modes, refer to "Access Modes for ATM DXI Services" in Chapter 2.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.14.1.9

Parameter: Multiprotocol Encapsulation

Path: Configuration Manager > Protocols > ATM DXI > Interfaces > **PVCs**

Default: LLC/SNAP

Options: LLC/SNAP │ NLPID │ NO MPE

Function: Determines whether the outbound packets on the selected interface are encapsulated with a multiprotocol header per RFC 1490 (NLPID) or RFC 1483 (LLC/SNAP). All direct access mode PVCs configured for the selected interface use the value of this field.

Instructions: We recommend selecting LLC/SNAP.

If you are running an ATM DXI version earlier than Version 8.00, select NLPID for backward compatibility.

If you select NO MPE, the router interprets this as virtual channel-based multiplexing, which is not supported for bridging.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.14.1.12

Parameter: **CS PDU Encapsulation**

Path: Configuration Manager > Protocols > ATM DXI > Interfaces > **PVCs**

Default: AAL5 Encapsulation

Options: AAL5 Encapsulation │ AAL3/4 Encapsulation │ No Encapsulation

Function: Determines whether the outbound packets on the grouped virtual channels use the AAL 3/4 CS PDU encapsulation or the AAL 5 CS PDU encapsulation. The encapsulating method is based on the ATM Forum's ATM DXI specification.

Instructions: Choose either AAL 3/4 or AAL 5 according to the desired encapsulation method. No Encapsulation is a proprietary value. Select this value when you do not want CS PDU encapsulation.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.14.1.13

Parameter: **Multicast**

Path: Configuration Manager > Protocols > ATM DXI > Interfaces > **PVCs**

Default: Unicast

Options: Unicast │ Multicast

Function: Indicates whether this PVC is multicast or unicast.

Instructions: Set to unicast or multicast, according to the PVC type.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.14.1.16

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Appendix B
Site Manager Default Settings

This appendix lists the Site Manager default parameter settings for ATM DXI. Use the Configuration Manager to edit these defaults.

Table B-1. ATM DXI Interface List Window

Parameter	Default
Enable	Enable
Interface Description	None
DXI Mode	Mode 1A
Max number of VCs	512
Multiprotocol Encapsulation	LLC/SNAP
CS PDU Encapsulation	AAL5 Encapsulation
Multicast	Disable
LMI Enable	Enable

Table B-2. ATM DXI Virtual Circuit Window

Parameter	Default
VPI Number	None
VCI Number	None

Table B-3. ATM DXI PVC List Window

Parameter	Default
Enable	Enable
Mode	Group Access
Multiprotocol Encapsulation	LLC/SNAP
CS PDU Encapsulation	AAL5 Encapsulation
Multicast	Unicast

Where to Go Next

Use the following table to determine where you want to go next.

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